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FEEDLOT WASTE MANAGEMENT

WHY & HOW

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Basic information on the problem of beef cattle feedlot waste management and the pollution arising from these operations is presented in a non-technical manner. The factors that cause feedlots to pollute and the magnitudes pollutants may reach are discussed along with some management factors and structural and mechanical means to help control water pollution. Sources of technical and financial assistance in design and layout of control facilities and the water pollution control agencies for the ten Missouri River Basin states are listed. Existing animal waste control regulations are also furnished for these ten states.

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FEEDLOT WASTE MANAGEMENT

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ACKNOWLEDGMENTS

The information presented in this publication has been drawn from many sources. Much has been taken from published findings of researchers who have been active in this field for some time through educational institutions and public agencies. The Agricultural Research Service, U. S. Department of Agriculture, has a comprehensive program of research and demonstrations concerning feedlot management and much of this writing utilizes information and concepts developed by this Service.

Guidance in preparation of this publication was provided by the Missouri River Basin Animal Waste Management Pilot (Steering) Task Group. This Group was formed in 1969 to present an interdisciplinary front to consider the animal waste problem in the area. The membership consists of a rancher, a Soil Conservation Service representative, a consulting engineer involved in design of pollution control facilities for feedlots, representatives of university engineering departments and extension service along with State and Federal water pollution control officials.

All photographs contained herein were furnished through the courtesy of the Soil and Water Conservation Research Division, Agricultural Research Service, USDA, Lincoln, Nebraska.

INTRODUCTION

The recent expansion of the cattle feeding industry in the United States has been generally to the more arid regions with the construction of new feedlots with large capacities. While this has taken place, however, numbers of cattle on feed in the Missouri River Basin have also increased and there remain thousands of feedlots in the area. In 1970, there were about 114,000 feedlots reported in seven of the basin states with 113,000 of these having a capacity of less than 1,000 cattle. This indicates a great number of lots operated by "farmer-feeders." That is, farm operators that produce the feed and possibly the feeder calves on their own land and do not feed the year around. This type of operation is more common in the "Corn-Belt" area of Missouri, Iowa, Minnesota, and the eastern sections of Kansas, Nebraska and South Dakota. In the western portion of the basin, however, the trend has been toward the larger installation.

causes of feedlot pollution

Whether it is a small farmer-feeder or a commercial feedlot of 80,000 head, environmental pollution can result from the operation. Poor management practices, improper cleaning, improper storage and disposal of manure, and improper drainage control can allow pollutants to enter the ground water, enter the surface water, or enter the atmosphere. While the magnitude of the problem may vary according to lot size and climatological conditions, good management techniques should be equally effective and pollution control measures can be adapted to most situations.

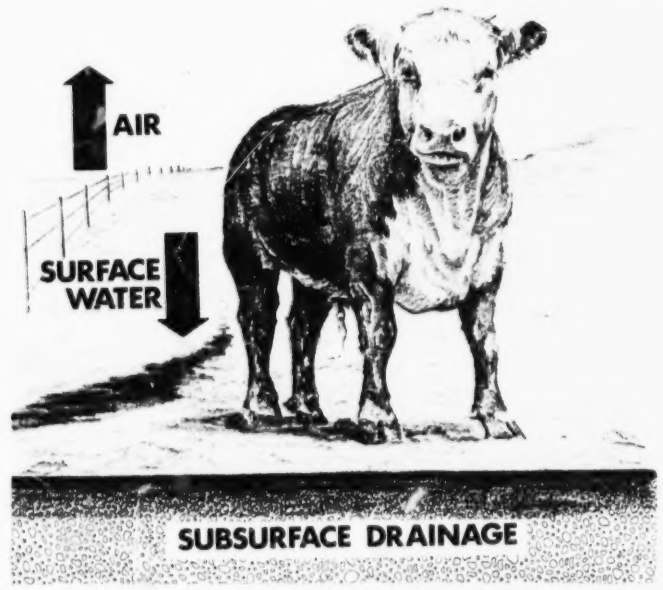
intent of this publication

We have attempted to present the current state of knowledge in the field of feedlot waste management. Much effort has been, is, and will continue to be expended in developing new and better ways of pollution control. Emphasis has been placed on the abatement of water pollution because of the immediate need in this area. *It is the intent of this publication to provide some basic information on the problem, some possible solutions to the problem and sources of information and assistance.*

PART I - THE PROBLEM

A feedlot may contribute to pollution of surface waters, ground waters and the air as well as create a solid waste disposal problem. Feedlot pollution

PATHS OF POLLUTION



paths of feedlot pollution

may manifest itself through (1) Runoff, (2) Direct drainage or manure deposition, (3) Ground waters, (4) Atmospheric odor and (5) Blowing dust.

Runoff resulting from precipitation or wastes deposited directly in a stream can lower the oxygen level, add ammonia and nutrients and possibly cause bacterial contamination. Nitrates may move down through the soil under the lot, reaching the groundwater and creating a potential health hazard.

FACTORS THAT CREATE THE PROBLEM

Odors, blowing dust and insects may exist at some time or other around a feedlot complex. These usually are localized pollution problems that may or may not be considered health hazards.

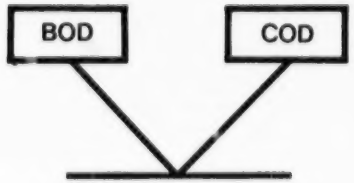
The amount and nature of wastes produced by beef cattle in a feedlot are dependent on the feed ration and water consumption and, therefore, are rather variable.

The following breakdown of wastes was developed for a 900-pound steer and is presented as an example.

60 lbs. wet manure per day (43 lbs. feces, 17 lbs. urine)
9 lbs. dry manure
85 percent moisture
Biochemical Oxygen Demand – 1-2 lbs. per steer per day
Chemical Oxygen Demand – 9 lbs. per steer per day
Volatile Solids – 7 lbs. per steer per day
Coliform Bacteria – 6 billion per steer per day

BOD and COD

The biochemical oxygen demand (BOD) is the classic sanitary engineering parameter that indicates the amount of oxygen required for aerobic (in the presence of oxygen) decomposition of wastes and is an indication of the amount of biologically degradable organic material present.



INDICATORS OF OXYGEN DEMANDING WASTES

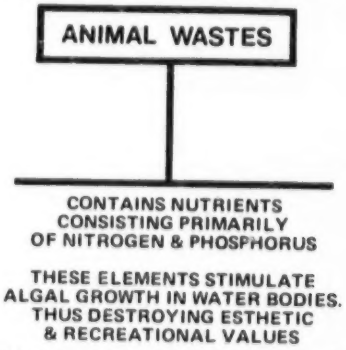
WHEN THESE OXYGEN – DEMANDING WASTES ENTER A STREAM, THE OXYGEN LEVEL OF THE WATER IS LOWERED AND FISH KILL MAY RESULT.

Chemical oxygen demand (COD) is a measure of the total oxygen consuming capacity of a waste but does not distinguish between biologically active and biologically inert matter. The ratio of COD/BOD is higher for

cattle manure than for domestic wastes and this indicates a less biodegradable material. In other words, cattle manure cannot be treated in a conventional municipal waste treatment type plant in the same manner as domestic wastes with the same degree of efficiency.

possible results of BOD and COD

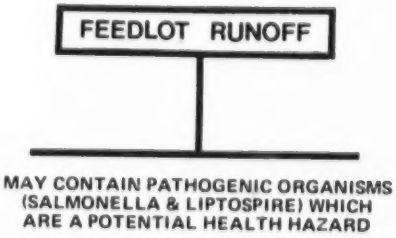
When these oxygen demanding wastes enter a stream, the oxygen level of the water is lowered and fish kills may result. The nutrient constituents found in animal wastes, along with the oxygen demanding materials, are primarily nitrogen and phosphorus. These elements, in the presence of certain trace compounds, can stimulate algal growths in bodies of water to a point where any recreational or esthetic enjoyment is limited or impossible.


ANIMAL WASTES
CONTAINS NUTRIENTS CONSISTING PRIMARILY OF NITROGEN & PHOSPHORUS
THESE ELEMENTS STIMULATE ALGAL GROWTH IN WATER BODIES. THUS DESTROYING ESTHETIC & RECREATIONAL VALUES

high coliform counts

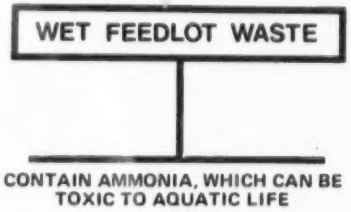
Solids carried by runoff can accelerate the filling of a lake or pond and high coliform (bacterial indicators) counts found in the runoff may limit recreational development of receiving waters due to the possible presence of pathogenic organisms. Salmonella and liptospire are two of the more common pathogens found in cattle wastes. Heavy deposits of wastes in a stream will destroy aquatic life and sometimes result in black, bubbling pools.

salmonella and liptospire

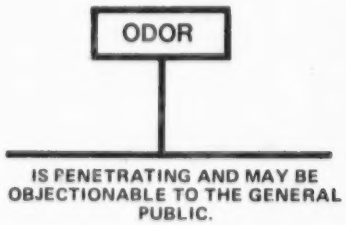


ammonia problems

Ammonia can be detected in the air around a feedlot but this small contribution to odors is not the important factor. Because of the high solubility of ammonia in water, the initial runoff from a feedlot could



contain sufficiently high concentrations to cause fish kills in the receiving stream as the tolerance limit of fish for ammonia is low. Another factor is that the ammonia that can be detected in the air is being absorbed by land and water surfaces around the lot and this in turn increases the nitrogen concentration which could cause excessive algal blooms in lakes or ponds. The movement of nitrates through the soil beneath a feedlot can create a health hazard if sufficient concentrations reach the groundwater table. This would appear to be a potential problem primarily during the initial months of operation or after abandoning the lot.



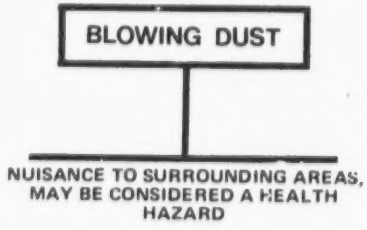
odors

Odors coming from feedlot operations can be caused by several compounds that are formed by bacterial action on organic matter. The resultant acids, alcohols, amines and other organic compounds are characterized by their smells, some of which can be very strong or penetrating and objectionable to the general public.

blowing dust

insects

During periods of dry weather, blowing dust can be a nuisance to surrounding areas and may be considered a health hazard. Insects, particularly flies, may be attracted by feedlot operations, especially around feed supplies. These should not be a problem outside the general feedlot area if the facility is properly managed.



MAGNITUDE OF THE PROBLEM

stabilization by bacterial action

If we assume the 900-pound steer that produces 60 pounds of wet manure a day is fed for 150 days, a total of 4.5 tons of material from that one animal would be deposited on the feedlot surface. It is not realistic to use this type of data to forecast the amount of waste that collects on the surface or the amount of pollutants that may be carried from a feedlot as a result of any given rain storm or snowfall, however. Much of the organic matter in the manure is stabilized by bacterial action after it is deposited on the lot. A high percentage of nitrogen contained in the manure and urine is lost to the atmosphere and perhaps one-half of the organic matter will be decomposed into carbon dioxide and water. The amount of decomposition that takes place is dependent on temperature and moisture conditions because the bacteria are more active under warm temperatures and more nitrogen is released to the atmosphere as nitrogen gas when the soil is wet. Consequently, there is a greater accumulation of wastes through the winter months than during the rest of the year.

accumulation greater through winter months

The loss of carbon and nitrogen from the waste causes a reduction in the organic content, an increase in minerals and an accumulation of undigested fibrous material. Consequently, this residual material does not respond to accepted biological waste treatment methods as do municipal wastes. It should be remembered, however, that while manure is decomposing in the lot, it is constantly being mixed with fresh droppings and, on an unsurfaced lot, with soil.

Several studies have been made on the amount of pollutants contained in feedlot runnoff. Using the results that have been presented on annual losses or contributions from lots, it can be shown that from five to ten percent of the pollutants originally contained in the raw waste may be carried by the runoff. Through these figures the use of population equivalents (10 people – 1 steer) is obviously not realistic. In fact, some studies have shown that this can be reversed to where ten cattle or more are required to equal the waste contribution of one person. Whether the waste ratio is ten men to one animal or one man to ten animals is really not significant to feedlot pollution control and these figures should not be used when speaking of the problem.

significant point concerning runoff

What is significant is that feedlot runoff produced by a particular rain storm or snowmelt may have a BOD of from one to several thousand milligrams per liter (mg/1), a COD of from several hundred to tens of thousands of mg/1 and a suspended solids content of around ten thousand mg/1. These figures show why the potential exists. They are volumetric measurements that indicate the strength of the runoff as compared to normal domestic sewage with a BOD and suspended solids concentration of 200 to 250 mg/1. This is the reason that a slug of runoff from a feedlot can depress oxygen levels and increase ammonia content in streams to a point where fish cannot survive, cover the streambed with solids thus eliminating aquatic life, create a nuisance condition and possibly a health hazard through bacterial contamination.

The same general pollutional characteristics are present and the same effect can result when manure is applied to frozen ground, on snow or under other conditions where snowmelt or rainfall can wash the material into streams or ponds or when a retention pond or treatment lagoon overflows. The effluents from the majority of animal waste treatment lagoons still exert an oxygen demand and contain solids and nitrogen in concentrations that make them unsuitable for discharge to a watercourse.

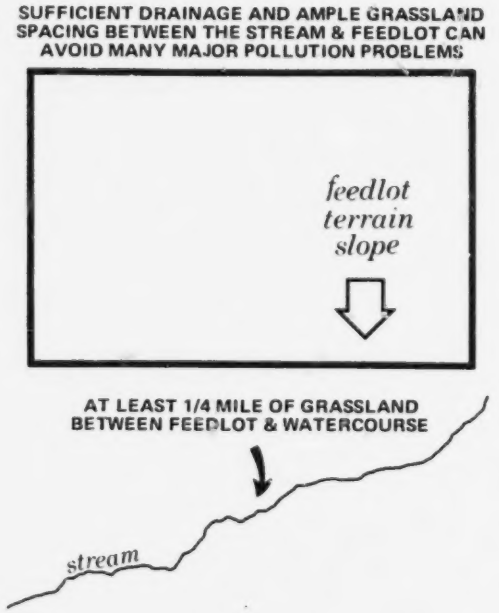
PART II - POSSIBLE SOLUTIONS

LOCATION

The importance of locating a feedlot away from a watercourse or body of water cannot be over-emphasized. If a lot can be located so that it is separated from a watercourse by at least one-fourth mile of grassland or similar plant growth, many pollution problems may be avoided. However, few locations are absolutely without pollution potential. When planning a new lot, adequate space should be available for construction of any necessary pollution control facilities.

FIG. 1

ideal location of feedlot should be away from watercourse


A DESIRED LOCATION
SUFFICIENT DRAINAGE AND AMPLE GRASSLAND SPACING BETWEEN THE STREAM & FEEDLOT CAN AVOID MANY MAJOR POLLUTION PROBLEMS
feedlot
terrain
slope
AT LEAST 1/4 MILE OF GRASSLAND BETWEEN FEEDLOT & WATERCOURSE
stream

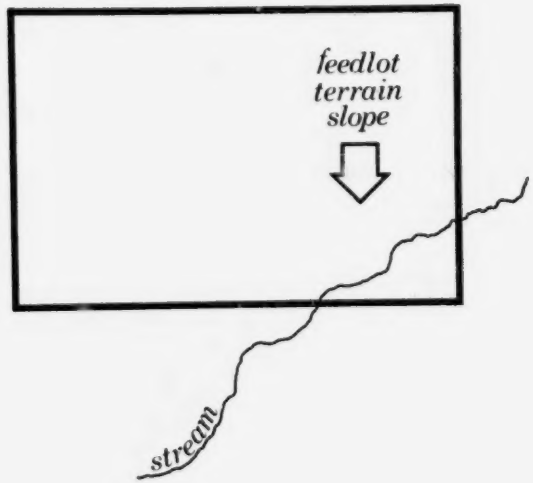
sufficient slope is ideal

A feedlot should have sufficient slope to permit drainage of surface water and it should be oriented to provide maximum exposure to sunlight. The maximum desirable slope for a particular installation is dependent on factors such as soil type, climate and stocking rate and will vary appreciably. The length of the slope over which runoff will move usually has a greater effect on the pollution potential than the degree of slope. Whenever possible, it is advisable to break up long slopes with terraces, pipe systems or other means that will divert the water from the lot at various points along the normal drainage pattern.

FIG. 2

AN UNDESIRED LOCATION

DIRECT, UNFILTERED DRAINAGE INTO STREAM CAN CAUSE & PERPETUATE A MULTITUDE OF MAJOR POLLUTION PROBLEMS



soil characteristics

Some restrictions may be placed on operations that propose to locate on sandy or gravelly soils or in areas where the groundwater table is close to the ground surface. Normal feedlot operations will generally result in the sealing of the lot surface but it is advisable for an operator to know the soil characteristics and groundwater level in his area and try to avoid problem situations.

direction of prevailing winds

Another factor to consider in location is the direction of the prevailing winds. Flies and other insects will usually move with the wind along with the dust and odors, and therefore, an installation should be downwind from a town or any other concentration of people. Similarly it should be located in an area that is or could be zoned for agricultural uses to protect against encroachment by residential areas.

MANAGEMENT

leave thin layer of manure

Good management through proper cleaning of a lot can influence the amount of pollutants that enter the environment. A thin layer of manure left on the lot surface will generally absorb about 0.5 inch of precipitation, and runoff may not occur as quickly as with a lot that has been stripped clean. This layer will also permit any impervious material to remain undisturbed and, therefore, more effective in preventing downward movement of pollutants.

management of water drainage

Watering facilities should be located so that spillage or overflow will drain off and not be permitted to flow across the lot. Roof drainage from shelters should also be diverted away from the lot.

feed spillage

Spilled feed around bunks can add to the pollutional problems through odors from decompositions, by being carried by runoff, or as a fly or rodent attraction. Extra care in placing feed in the bunks can pay off in savings in feed costs and in reducing the pollution potential.

dust control

Another management factor is the control of dust. Sprinkling appears to be the primary control method in use at this time and will probably continue to be. In some areas, different types of bedding are used, such as sawdust or wood chips and this will have an effect on runoff characteristics and associated problems. Generally speaking, the disposal of combined bedding – manure has not presented a great problem because of the limited use of bedding.

MOUNDING

Mounding of manure within the feedlot has been practiced for some time by many operators. This mound provides a place where cattle can get out of the mud during wet seasons and a warm surface during cold weather. This warmth is due to bacterial action on the wastes in the mound which is basically a compost pile. (Refer to page 10)

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REEVE'S FEEDLOT NEAR CENTRAL CITY, NEBRASKA (ARS RESEARCH SITE)

TERRACES

runoff slowed and solids removed

The use of terraces to reduce the strength and volume of runoff is being studied at this time. With this concept, the velocity of the runoff is slowed so that solids may settle out in the terrace system before it flows on to a holding facility. Terraces used in this manner would be of the broad basin type.

Ideally, the discharge from the terraces should be controlled so that runoff could be held behind each one as required to permit solids settling. These controlled outlets may drain into a collection channel or a common pipe that will lead to the holding facility. The solids that accumulate behind the terraces can be removed with tractor front end loaders during dry periods as necessary. (See page 12)

SETTLING CHANNELS

purpose same as terrace

The purpose of settling channels is essentially the same as the terrace concept except the channel is located outside of the feedlot. Through the use of porous structures that impede the flow of runoff, but do not stop it, the velocity is lowered so that solids will be deposited in the channel before reaching a holding pond. If the topography of the area permits, the channel may be constructed on a very flat grade and this will permit settling of solids without the flow impeding structures. The channel should be constructed so

that solids can be removed with equipment used in the general operation of the feedlot.

In order to be effective all runoff should pass through the entire length of the channel. For a large feedlot, more than one system of channels and ponds may be necessary and space for the location of these may place some restriction on their use in existing installations. For a new lot this type of system could be an integral part of the overall design and layout. (See page13)

HOLDING PONDS

While holding ponds have been mentioned in connection with broad basin terraces and settling channels, they are an effective means of controlling water pollution in themselves. In designing a system that does not provide for solids settling ahead of the ponds, a small cell of about 10 percent the capacity of the main cell should be provided to trap solids before the flow reaches the main retention structure. This cell should be constructed in a manner that will permit the removal of solids by pumping, or if necessary, by dragline.

Odors may arise from the solids settling cell if material is left to accumulate for any length of time and bacterial action begins. Also, if a dragline is required to clean the structure, the operation could be time consuming and relatively costly, but the overall cost of maintaining these facilities is reasonable.

Liquid must be removed from the system and applied to the land as soon as possible after runoff has occurred in order to have storage space for the next event. Proper measures should be taken to prevent contamination of surface waters by runoff from the irrigation system. Also, some land that has been used for solids disposal should not be irrigated unless the solids have been turned under and will not be picked up by the applied water or unless the land has a well developed reuse system such as tail water ponds. Location and topography of the land will determine when this applies. (See page 14)

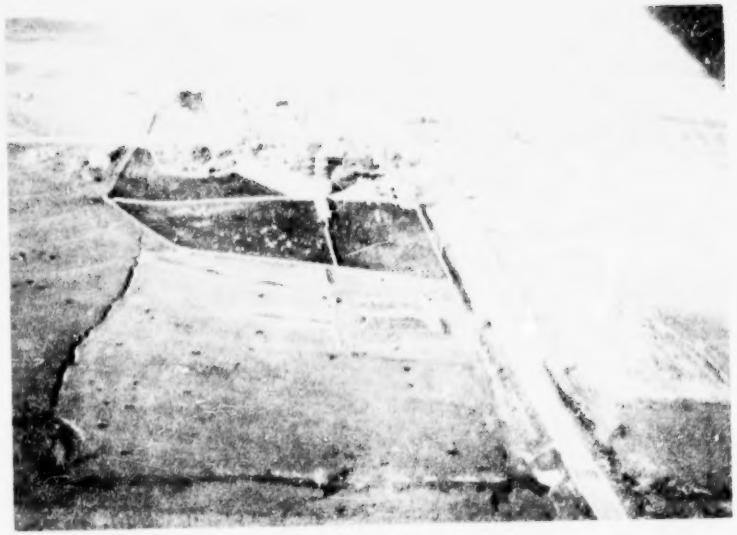
THE "LIVING" FILTER

The basic concept of this system is one of providing a specified area for runoff disposal based on the estimated amount of solids contained in the runoff after it passes through a settling channel of some type. The system consists of the settling channel, a holding pond and the liquid disposal or "filter" area. Solids that settle out in the channel would be removed to a separate disposal area and the liquid would be applied through irrigation pumps and piping or by a gravity distribution system depending on the individual situation.

COCKERILL
FEEDLOT NEAR
SPRINGFIELD, NEBRASKA
(ARS DEMONSTRATION SITE)

SAME ARS DEMONSTRATION
SITE SHOWN ABOVE

KRAMBECK
FEEDLOT NEAR
GRETNA, NEBRASKA
(ARS DEMONSTRATION SITE)



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POROUS DAM BELOW
FEEDLOT SHOWN ABOVE

The design of this type of pollution control facility would be based on the holding pond having enough capacity to hold runoff until it can be applied to the disposal area and there will be no discharge from the area into watercourses. The application rate is in terms of tons of solids per acre of pasture or cropland for this method while other land disposal methods may consider inches of water per acre or some other approach.

TREATMENT LAGOONS

types of lagoons

The use of lagoons or ponds as a waste water treatment method has been accepted for some time especially in the municipal and industrial area where waste loadings are of a continuous nature. The ponds or lagoons that catch feedlot runoff are loaded on an intermittent basis and this can cause operational difficulties and affect treatment efficiency. There are three types of lagoons that may be used to stabilize cattle manure:

ANAEROBIC

bacteria working in absence of oxygen

Stabilization of organic matter in the runoff is accomplished by bacteria working in the absence of oxygen. A considerable amount of gas may be produced during decomposition and objectionable odors can result. This type of lagoon can be used to hold wastes that will be spread on land or as a biological treatmen unit. It will not produce an effluent that would be acceptable for discharge to a stream.

AEROBIC

natural re-aeration to supply oxygen

Aerobic lagoons depend on natural re-aeration and algae for oxygen to support bacteria that will stabilize wastes. Because cattle manure has an extremely high oxygen demand, this is not a feasible type of facility due to the large water surface area required to supply sufficient oxygen.

AERATED

mechanical injection of air and oxygen

Aerobic conditions can be maintained through injection of air into the waste water by using mechanical or diffused aeration equipment. The oxidation ditch is a form of mechanical aeration that has recently been used in some confined housing operations where cattle are on slotted floors and the wastes drop directly into the

ditch. The concept ususally employs two or more paddle wheel type aerators that keep the liquid circulating around a "race track" type ditch and add oxygen at the same time. This results in an operation that should be odor free and effective in waste stabilization but the overflow or effluent cannot be discharged to a stream without additional treatment.

While this system can develop problems such as foaming, freezing and mechanical failure, the general concept is the most satisfactory application of waste stabilization for total confined feeding. It does require proper operation and maintenance and completely enclosed buildings are recommended to avoid freezing in cold climates.

Floating, turbine type mechanical aerators or systems of submerged air lines with diffusers that are used in municipal waste treatment plants can be applied to feedlot wastes but as with the ditch system, a satisfactory effluent will not be produced. The initial cost and operation and maintenance costs and problems have made these two systems of aeration less than feasible for many installations insofar as a treatment method is concerned. Their use as odor control devices should not be overlooked, however, Intermittent operation can provide sufficient oxygen to prevent odors and not be prohibitive in cost.

BASIS OF DESIGN

design varies from locale to locale

The basis of design for the preceding waste management methods will vary from locale to locale. The rainfall characteristics of the area will be the greatest variable and each installation must be evaluated separately as to runoff potential, quality and quantity. For that reason, no attempt has been made to present design or layout information. Feedlot operators or managers should consult qualified individuals for assistance in evaluating their situations and where applicable, in design and layout of waste handling facilities.

PART III
SOURCES OF TECHNICAL ASSISTANCE

The agency or agencies responsible for pollution control vary from state to state. A list of water pollution control agencies within the Missouri River Basin along with the appropriate responsible official's name and title are included in the appendices of this publication.

Inquiries concerning specific requirements for complying with state water pollution control laws in developing and maintaining a feedlot should be directed to these individuals. Those laws and regulations relating to water pollution that are in existence at this time may be found following the list of pollution control agencies.

While current emphasis is being placed on water pollution, localized problems resulting from air pollution, primarily odors, are becoming more numerous. Generally involved are "nuisance" issues and not violation of air quality standards. There does exist in each state an air pollution control authority that could become concerned if necessary.

UNIVERSITY EXTENSION SERVICE

The primary mission of the Extension Service is to diffuse information based on USDA, Agricultural Experiment Station, and other valid and reliable research to solve relevant and current problems. The Service is placing a high priority on providing the latest technological, management and policy information on animal waste management. This includes giving leadership and working in close cooperation with research staff in developing design criteria for feedlot waste management systems. This information is available to all interested individuals and agencies.

Close working relationships are maintained with pollution regulatory agencies in developing and implementing economical, feasible and efficient feedlot waste management systems. The University Extension Offices at the local level should be contacted for assistance and information.

SCS, USDA

The Soil Conservation Service may provide assistance in the design and layout of pollution control facilities for feedlots up to a specified maximum size. This specified size may vary somewhat between states and an individual area office may alter this if circumstances warrant. Anyone desiring information on this program should contact their nearest SCS District Conservationist.

As previously stated, in some states the Soil Conservation Service can design and lay out pollution control facilities for relatively small feedlots. For those instances where the SCS is unable to provide this service, the installation is too large or state law so requires, a consulting engineering firm should be retained.

This is a relatively new field for the consultant but there are firms that have been involved in feedlot pollution control work for some time. The state water pollution control agency can provide a list of professional engineers qualified to practice within that state and would know those firms that are working with the feeding industry.

CONSULTING ENGINEERS

The Environmental Protection Agency (EPA) administers national programs for water and air quality enhancement, solid waste disposal, water hygiene and pesticides and radiation regulation. The Regional Offices of EPA are available to furnish information on Federal environmental programs and also as a source of technical information and assistance.

PART IV
SOURCES OF FINANCIAL ASSISTANCE

ASCS, USDA

The Agricultural Stabilization and Conservation Service has provided financial assistance in some states under the former Agricultural Conservation Program (ACP). Under this cost-sharing program, funds could be provided for construction of pollution control structures with maximum participation limited to amounts that varied from state to state.

The ACP has been restructured and is now called the Rural Environmental Assistance Program (REAP). This will continue the ACP practices but greater Federal participation may be possible in some cases where the public benefits through environmental enhancement practices.

It has been the practice that the State ASCS Committee determines whether or not that particular state participates in cost-sharing for construction of pollution control structures. Similarly, a county committee may elect to not participate even though the state does. Since this program varies from state to state, and even county by county, the local county ASCS committee should be consulted as to its current programs and policies.

SCS, USDA

The Great Plains Conservation Program administered by the Soil Conservation Service provides for assistance to farmers and ranchers through contracts for conservation and pollution control work. These contracts are entered into with USDA for a period of several years.

This is not a REAP program but one that is under the direction of the Soil Conservation Service. Only certain areas of the Great Plains have been designated as eligible for assistance and, therefore, the District Conservationist should be consulted to see if a particular locale is covered and if funds are available.

FHA
USDA

The Farmers Home Administration (FHA) has a program that may provide funds for the disposal of wastes (including solid wastes) but only public bodies or not for profit organizations that have authority to tax, issue bonds, etc., can qualify for these grants and loans. This is the same program that provides assistance to small municipalities for construction of sewerage systems.

Funds for construction of waste management facilities could be included in a real estate loan for land purchase or farm improvement from the FHA. The local County Supervisor for the Administration should be consulted about these and other programs, their requirements and provisions.

APPENDIX A

STATE WATER POLLUTION CONTROL AGENCIES

STATE AGENCIES

COLORADO

Water Pollution Control Division
Colorado Department of Health
4210 East 11th Avenue
Denver, Colorado 80220

Mr. Frank J. Rozich, Director

IOWA

Iowa Water Pollution Control Commission
Iowa State Department of Health
Lucas State Office Building
Des Moines, Iowa 50319

Mr. R. J. Schliekelman, Technical Secretary

KANSAS

Environmental Health Services
Kansas State Department of Health
Topeka, Kansas 66612

Mr. Melville W. Gray, Director and Chief Engineer

MINNESOTA

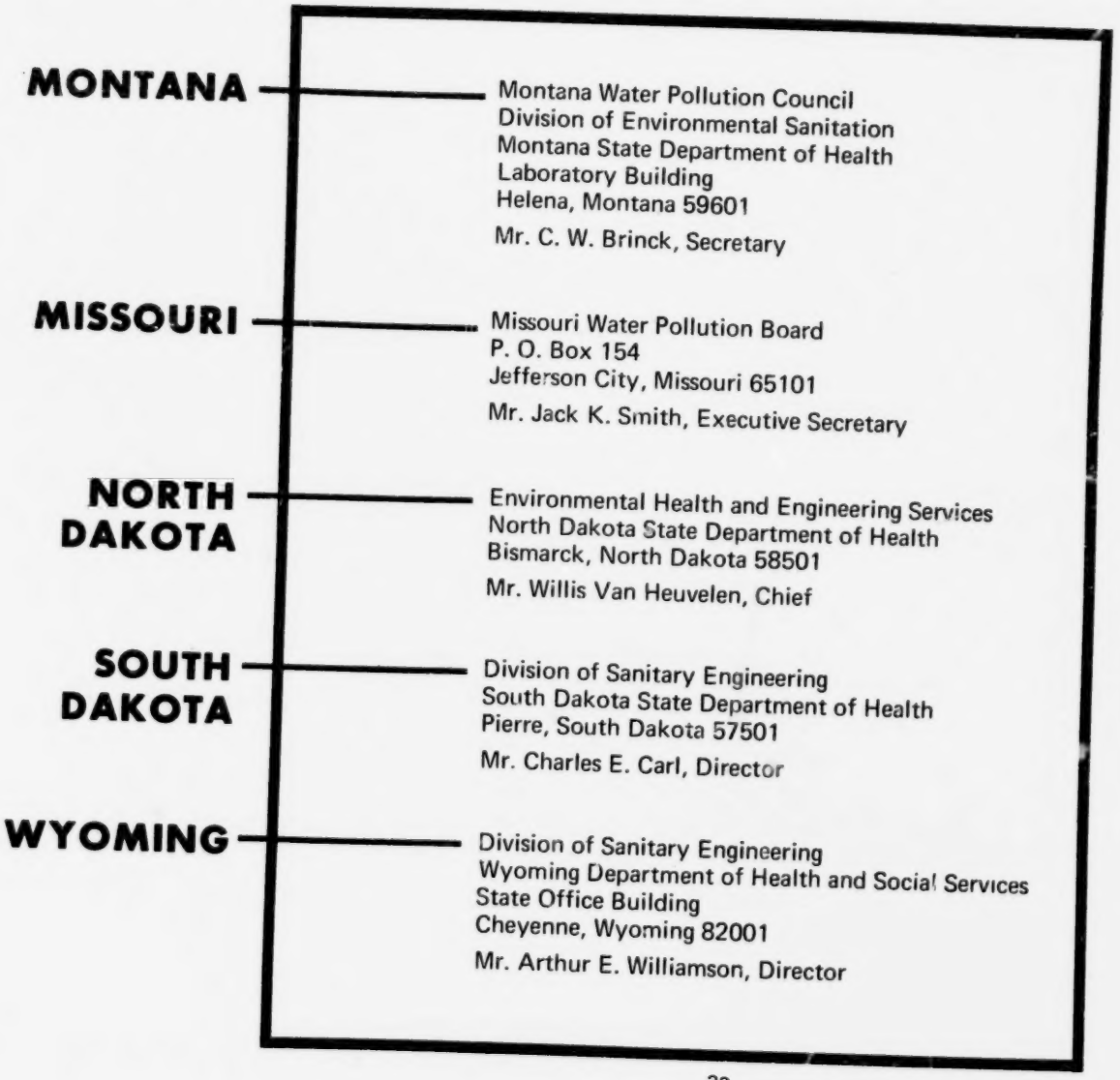
Minnesota Pollution Control Agency
(water, air, solid wastes)
717 Delaware Street, S.E.
Minneapolis, Minnesota 55440

Mr. Grant J. Merritt, Director

NEBRASKA

Nebraska Water Pollution Control Council
State Department of Health
State House Station, Box 94757
Lincoln, Nebraska 68509

Mr. T. A. Filipi, Executive Secretary


MONTANA
Montana Water Pollution Council
Division of Environmental Sanitation
Montana State Department of Health
Laboratory Building
Helena, Montana 59601
Mr. C. W. Brinck, Secretary
MISSOURI
Missouri Water Pollution Board
P. O. Box 154
Jefferson City, Missouri 65101
Mr. Jack K. Smith, Executive Secretary
NORTH DAKOTA
Environmental Health and Engineering Services
North Dakota State Department of Health
Bismarck, North Dakota 58501
Mr. Willis Van Heuvelen, Chief
SOUTH DAKOTA
Division of Sanitary Engineering
South Dakota State Department of Health
Pierre, South Dakota 57501
Mr. Charles E. Carl, Director
WYOMING
Division of Sanitary Engineering
Wyoming Department of Health and Social Services
State Office Building
Cheyenne, Wyoming 82001
Mr. Arthur E. Williamson, Director

APPENDIX B

STATE LAWS OR REGULATIONS FOR FEEDLOTS

As of May 1, 1971

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COLORADO

RULES FOR THE CONTROL OF WATER POLLUTION FROM LIVESTOCK CONFINEMENT FACILITIES

AUTHORITY:

Chapter 44, Session Laws 1966, as amended by Chapter 217, Session Laws 1967, Sections 5(e), and 8.

DEFINITIONS

A. "Commission" means the Colorado Water Pollution Control Commission.

B. "Person" means any individual, partnership, corporation or association doing business in this state, in whole or in part.

C. "Livestock Confinement" means cattle, calves, sheep, swine, horses, mules, goats and fowl corralled, penned, tethered, or otherwise caused to remain in pens or corrals where feeding is other than grazing.

D. "Feedlot Operator" means any person engaged in the business, as owner, operator or manager of a place, establishment or facility commonly known as a feedlot, and including any facility commonly known as a stockyard, veterinary clinic or other livestock confinement facility, consisting of pens or corrals used for the purpose of holding livestock for feeding and for holding such livestock for sale, shipment of slaughter or treatment.

E. "Abatement Schedule" means the prescribed time schedule for investigation, completion, completion of plans, the construction of facilities and final date of abatement of pollution.

PREVENTION OF WATER POLLUTION:

A. Every Feedlot Operator shall take all reasonable preventative measures to avoid the pollution of the waters of this state due to surface runoff

waters or discharges from within feedlots or stockyard enclosure, or from manure or sludge storage areas appurtenant thereto.

B. To the extent necessary, minimum preventative measures shall include the construction of sealed collection and retention ponds; provision for adequate drainage to prevent the collection of surface waters within such enclosures or upon appurtenant areas; the use of mechanical means for scraping, cleaning and grading all areas which could contribute to water pollution; the disposal of animal excrements and other wastes, and the diversion of surface runoff or drainage waters prior to contact with contaminating areas or substances.

COMMISSION REQUIREMENTS:

A. The Commission, upon finding the preventative measures utilized by a Feedlot Operator to be either inadequate to prevent water pollution or non-existent, may require a Feedlot Operator to adopt one or more of the foregoing stated preventative measures, and such other measures as the Commission may deem reasonably necessary to prevent water pollution, including the installation of a waste treatment facility for surface runoff waters or discharge water from within feedlot and stockyard enclosures and manure and sludge storage areas appurtenant thereto.

B. The Commission will establish a water pollution abatement schedule for each feedlot found to have inadequate preventative measures.

IOWA

PURSUANT TO AUTHORITY OF SECTIONS 455B.9 and 455B.13, CODE OF IOWA 1966, THE FOLLOWING RULES ARE ADOPTED AND ADDED TO CHAPTER 1.

1.3(455B) CONFINED FEEDING OPERATIONS WASTE WATER DISPOSAL

1.3(1) DEFINITION.

Confined feeding operations for livestock and poultry in which potential

pollution may exist and subject to regulations are defined as follows:

A. Cattle feedlot is one or more adjacent or nearby cattle enclosures on a single property where there are at least 100 cattle and where animal population is greater than 1 animal for each 600 square feet.

1.3(2) CONDITIONS REQUIRING REGISTRATION.

Registration of the following confined feeding operations is required when one or more of the following conditions exist:

A. Cattle

(1) The number of cattle confined in a feedlot exceeds 1,000 head;

(2) The feedlot contributes to a watercourse draining more than 3200 acres of land above the lot and the distance to the nearest point on the affected watercourse is less than 2 feet per head of cattle in the feedlot;

(3) The runoff water from a feedlot or overflow from a lagoon or liquid manure storage tank flows into a tile line or other buried conduit, drainage well, pumped well, abandoned well or sinkhole.

1.3(3) REQUIRED INFORMATION UNDER CONDITIONS REQUIRING REGISTRATION.

A. Persons engaged in livestock and poultry operations described in Rules 1.3(1) and 1.3(2) prior to July 1, 1969, shall upon notification register such operation with the commission. Persons intending to initiate livestock and poultry operations as described in Rules 1.3(1) and 1.3(2) shall register such operation with the commission before commencing such operations and provide such information as the commission may reasonably require. Such information shall be made on a form supplied by the state department of health;

B. Operators shall submit the completed registration form to the department together with supplemental information regarding general features of topography, drainage course and identification of ultimate primary receiving streams. Additional information which may be deemed necessary for satisfactory evaluation of potential pollution may be required by and shall be submitted to the department;

C. If the department determines that a proposed or existing confined

feeding operation does not constitute a water pollution problem because of location, topography, or other reasons, provisions for water pollution control facilities will not be required;

D. If the department determines that a confined feeding operation is, in fact, polluting or may reasonably pollute waters of the state, the operator shall obtain a permit for disposal of waste water therefrom and shall provide necessary water pollution control facilities which shall be constructed in accordance with plans and specifications approved by the department. The following factors will be considered when applicable, in forming a judgement as to whether a confined feeding operation will or will not constitute a potential water pollution problem:

   (1) Soil type.

   (2) Distance to stream.

   (3) Type of land between feedlot and stream.

   (4) Slope of land or time for waste to seep into soil before entering stream.

   (5) Control of waste discharge in proportion to stream flow.

   (6) Distance to structures occupied by humans.

1.3(4) REQUIREMENTS FOR FACILITIES.

Required water pollution control facilities shall be constructed and maintained to meet the minimum requirements stated in the following paragraphs, provided that when site topography, operating procedures, and other available information indicate that adequate water pollution control can be effected with less than the minimum requirements, the minimum requirements may be waived; provided further that if site topography, operating procedures, experience, and other available information indicate that more than minimum requirements will be necessary to effect adequate water pollution control, additional control provisions may be required.

A. The minimum water pollution control facilities for the uncovered confined feeding operations shall be terraces or retention ponds capable of containing 3 inches of surface runoff from the feedlot area, waste storage areas, and all other waste contributing areas. Diversion of surface drainage prior to contact with the confined feeding area or

manure or sludge storage areas shall be required. A settling basin preceding the retention ponds shall be provided where necessary to facilitate solids removal. Waste retained in detention ponds shall be disposed of as soon as practicable to insure adequate retention capacity for future needs;

B. Waste treatment or other methods of water pollution control shall be permitted where the department determines that effective results will be obtained;

C. Waste handling facilities shall be designed and reviewed in conformance with chapter 114, Code of Iowa, 1966. Services of personnel of the local soil conservation districts may be used in the design and layout of water pollution control facilities. If waste treatment facilities consist only of pond or lagoon type structures, there shall be a minimum of two such structures for series operation.

1.3(5) OPERATION OF FACILITIES.

A. The water pollution control facilities shall be operated and maintained so as to prevent water pollution and to protect the public health and beneficial uses of the waters of the state;

B. Waste discharges from retention ponds, lagoons, or waste treatment facilities into any watercourse shall be in conformance with the appropriate water quality criteria adopted by the Iowa water pollution control commission;

C. Waste materials removed from retention ponds, waste treatment facilities, or confined feeding operations shall be disposed of or stockpiled in a manner which will not contribute to water pollution. Wastes may be used for irrigation or spread on land surface and mixed with the soil in a manner which will prevent runoff of wastes. Other methods of disposal of wastes from retention ponds, retention lagoons, waste treatment facilities or feeding operations shall be evaluated and permitted if the department determines that effective water pollution control will be accomplished.

These rules are intended to implement section 455B.9, Code of Iowa 1966 as amended by House File 598, Acts of the Sixty-third General Assembly.

These rules shall become effective as provided in Chapter 17A of the Code upon filing in the office of the Secretary of State.

KANSAS

CHAPTER 28. STATE BOARD OF HEALTH REGULATIONS
ARTICLE 18. AGRICULTURAL AND RELATED WASTES CONTROL

28-18-1 DEFINITIONS

For purposes of the regulations in this article, the following words, terms and phrases are hereby defined as follows:

A. The words "confined feeding" shall mean the confined feeding of animals for food, fur, or pleasure purposes in lots, pens, pools or ponds which are not normally used for raising crops and in which no vegetation, intended for animal food, is growing. This will not include a wintering operation for cows in lots or on farming ground unless the operation causes a pollution problem.

B. The words "confined feeding operation" shall mean (1) any confined feeding of 300 or more cattle, swine, sheep or horses at any one time, or (2) any animal feeding operation of less than 300 head using a lagoon, or (3) any other animal feeding operation having a water pollution potential, or (4) any other animal feeding operation whose operator elects to come under these regulations.

C. The term "operator" shall mean an individual, a corporation, a group of individuals, joint venturers, a partnership, or any other business entity having charge or control of one or more confined feeding installations.

D. "Food animals" shall mean fish, fowl, cattle, swine, and sheep.

E. "Fur animals" shall mean any animal raised for its pelt.

F. "Pleasure animals" shall mean dogs and horses.

G. The words "waste retention lagoon" or "retention ponds" shall mean excavated or diked structures, or natural depressions provided for or used for the purpose of containing or detaining animal wastes consisting of body excrements, feed losses, litter, cooling waters, wash waters, whether separately or collectively, or any other associated materials detrimental to water quality or to public health, or to beneficial uses of the waters of the state. A waste retention structure shall not be construed to be a treatment facility and discharges of waste water

therefrom shall not be allowed except as authorized by regulations 28-18-3 and 28-18-4.

H. The words "waste treatment facilities" shall mean structures and/or devices which stabilize, or otherwise control pollutants so that after discharge of treated wastes, water pollution does not occur and the public health and the beneficial uses of the waters of the state are adequately protected.

I. The words "water pollution control facilities" shall mean waste retention lagoons, retention ponds, or waste treatment facilities.

J. The term "department" shall mean the Kansas State Department of Health. (Authorized by K.S.A. 65-164, K.S.A. 65-171f, K.S.A. 65-165 as amend., K.S.A. 65-167 as amend., K.S.A. 65-171d as amend., K.S.A. 65-171h as amend.; effective 31 May 1967.)

28-18-2 REGISTRATION AND WATER POLLUTION CONTROL FACILITIES PERMITS

A. Effective July 1, 1967, the operator of any newly proposed confined feeding operation as defined in regulation 28-18-1(b) must register with the Kansas State Department of Health prior to construction and operation of the lot, pen, pool or pond. The operator of any existing confined feeding operation as defined in regulation 28-18-1(b) must register by January 1, 1968. Application for registration shall be made on a form supplied by the department.

B. Applicants shall submit the completed application form to the department together with supplemental information regarding general features of topography, drainage course and identification of ultimate primary receiving streams. Additional information which may be deemed necessary for satisfactory evaluation of the application may be required by and shall be submitted to the department.

C. If in the judgement of the department, a proposed or existing confined feeding operation does not constitute a potential water pollution problem because of location, topography, or other . sons, provision of water pollution control facilities will not be required.

D. If in the opinion of the department a confined feeding operation does constitute a water pollution potential, or if water pollution occurs as a result of any confined feeding operation, the operator shall provide

water pollution control facilities which shall be constructed in accordance with plans and specifications approved by the department.

E. Water pollution control facilities shall not be placed in use until a permit has been issued. Permits for water pollution control facilities will be issued by the executive secretary of the Kansas State Board of Health upon satisfactory completion of construction in accordance with plans and specifications approved by the department. Water pollution control facilities permits shall be revocable for cause on thirty days' written notice. If a water pollution control facilities permit is revoked, the owner or operator of the confined feeding operation involved shall be allowed to finish feeding existing animals in the lot, pen, pool or pond at the time of revocation but shall not place or allow to be placed in the lot, pen, pool or pond any other animals until the minimum requirements for water pollution control as set forth in regulations 28-18-3 and 28-18-4 have been met and a new water pollution control facilities permit has been issued. (Authorized by K.S.A. 65-164, K.S.A. 65-171f, K.S.A. 65-165 as amend., K.S.A. 65-166 as amend., K.S.A. 65-167 as amend., K.S.A. 65-171d as amend., K.S.A. 65-171h as amend.; effective 31 May 1967.)

28-18-3 REQUIREMENTS FOR FACILITIES

Water pollution control facilities required shall be kept at the minimum requirements stated in the following paragraphs; provided that when site topography, operating procedures, and other available information indicate that adequate water pollution control can be effected with less than the minimum requirements, the minimum requirements may be waived; provided further that if site topography, operating procedures, experience, and other available information indicate that more than the minimum requirements will be necessary to effect adequate water pollution control, additional control provisions may be required.

A. CATTLE: The minimum water pollution control facilities for the confined feeding of cattle shall be retention ponds capable of containing three inches of surface runoff from the feedlot area, waste storage areas, and all other waste contributing areas. Diversion of surface drainage prior to contact with the confined feeding area or manure or sludge storage areas shall be permitted. Waste retained in detention ponds shall be disposed of as soon as practicable to insure

adequate retention capacity for future needs.

B. SWINE: Waste retention lagoons for swine feeding operations may be allowed in lieu of waste treatment facilities. Waste retention lagoons must be capable of retaining all animal excreta, litter, feed losses, cooling waters, wash waters, and any other associated materials and shall additionally be capable of retaining three inches of rainfall runoff from all contributing drainage areas. Diversion of surface drainage prior to contact with the confined feeding area or manure or sludge storage areas shall be permitted. Provision must be made for periodic removal of waste material from retention lagoons.

C. SHEEP: The minimum water pollution control facilities for the confined feeding of sheep shall be retention ponds capable of containing three inches of surface runoff from the confined feeding area, waste storage areas, and all other waste contributing areas. Diversion of surface drainage prior to contact with the confined feeding area or manure or sludge storage areas shall be permitted. Waste retained in detention ponds shall be disposed of as soon as practicable to insure adequate retention capacity for future needs.

D. OTHER ANIMALS: Each confined feeding operation registered involving other animals shall be evaluated on its own merits with regard to the water pollution control facilities required, if any. The confined feeding of other animals shall not cause or lead to the pollution of the waters of the state by runoff water from confined feeding areas, release or escape of water from pools or ponds, improper storage or disposal of waste materials removed from the confined feeding area, or by any other means.

E. Waste treatment facilities shall be designed, constructed, and operated in conformance with the provisions of regulations 28-18-4. If waste treatment facilities consist only of pond or lagoon type structures, there shall be a minimum or two such structures for series operation.

F. Other methods of water pollution control shall be permitted where in the judgment of the department effective results will be obtained (Authorized by K.S.A. 65-164, K.S.A. 65-171f, K.S.A. 65-165 as amend., K.S.A. 65-166 as amend., K.S.A. 65-167 as amend., K.S.A. 65-171d as amend., K.S.A. 65-171h as amend.; effective 31 May 1967.)

28-18-4 OPERATION OF FACILITIES

A. The water pollution control facilities shall be operated and maintained so as to prevent water pollution and to protect the public health and the beneficial uses of the waters of the state.

B. Waste discharges from retention ponds, lagoons, or waste treatment facilities into any watercourse shall be in conformance with the water quality requirements of the appropriate river basin criteria as set forth in chapter 28, article 16 of regulations adopted by the Kansas State Board of Health and regulation 28-18-3.

C. Waste materials removed from retention ponds, waste treatment facilities, and/or confined feeding areas shall be disposed of or stockpiled in a manner which will not contribute to water pollution. Wastes may be used for irrigation or spread on land surface and mixed with the soil in a manner which will prevent runoff of wastes. Other methods of disposal of wastes from retention ponds, retention lagoons, waste treatment facilities, and/or confined feeding areas shall be evaluated and permitted if in the judgment of the department effective water pollution control will be accomplished. (Authorized by K.S.A. 65-164, K.S.A. 65-171f, K.S.A. 65-165 as amend., K.S.A. 65-166 as amend., K.S.A. 65-167 as amend., K.S.A. 65-171d as amend., K.S.A. 65-171h as amend.; effective 31 May 1967.)

MINNESOTA

REGULATIONS FOR THE CONTROL OF WASTES FROM LIVESTOCK FEEDLOTS, POULTRY LOTS AND OTHER ANIMAL LOTS

PREAMBLE

An adequate supply of healthy livestock, poultry and other animals is essential to the well being of Minnesota citizens and the nation. They provide our daily source of meat, milk, eggs and fiber. Their efficient, economic production must be the concern of all consumers if we are to have a continued abundance of high-quality, wholesome food and fiber at reasonable prices.

However, livestock, poultry and other animals produce wastes which may, when improperly stored, transported or disposed of, affect Minnesota's environment. Where such wastes could add to air, water or land pollution they must be controlled.

The following regulations for the control of livestock, poultry and other animal wastes are drafted to provide protection against pollution by domesticated animals. They are written with full understanding that animal wastes are often by-products beneficial to the economic production of agricultural crops.

These regulations are written to provide the greatest safe latitude in compliance, taking into consideration that agriculture has 20 to 30 years of experience in successful soil and water conservation. Control measures, where deemed necessary, are to be individually designed and developed to provide the specific controls needed for the operation in question.

The regulations comply with the specific policy and purpose of the State of Minnesota in regard to solid waste control as set forth in Laws 1969, Chapter 1046 (Codified as Minnesota Statutes, Section 116.07).

Subd. 2. The Pollution Control Agency shall also adopt standards for the control of the collection, transportation and disposal of solid waste for the prevention and abatement of water, air and land pollution, recognizing that due to variable factors, no single standard of solid waste control is applicable to all areas of the State. In adopting standards, the Pollution Control Agency shall give due recognition to the fact that elements of control, which may be reasonable and proper in densely populated areas of the State, may be unreasonable and improper in sparcely populated or remote areas of the State, and it shall take into consideration in this connection such factors, including others which it may deem proper, as existing physical conditions, topography, soils and geology, climate, transportation and land use. Such standards of solid waste control shall be premised on technical criteria and commonly accepted practices.

Subd. 4. Pursuant and subject to the provision of Chapter 15, and the provisions hereof, the Pollution Control Agency may adopt, amend and rescind regulations and standards having the force of law relating to any purpose within the provisions of this act for the collection, transportation and disposal of solid waste and the prevention, abatement or control of water, air and land pollution, which may be related thereto, and the deposit in or on land of any other material that may tend to cause pollution. Any

such regulation or standard may be of general application throughout the State or may be limited as to times, places, circumstances, or conditions in order to make due allowance for variations therein. Without limitations, regulations or standards may relate to collection, transportation, disposal equipment, location, procedures, methods, systems or techniques or to any other matter relevant to the prevention, abatement or control of water, air and land pollution which may be advised through the control of collection, transportation and disposal of solid waste; and the deposit in or on land of any material that may tend to cause pollution.

Wastes other than solid wastes are subject to control under the authority of Minnesota Statutes, Section 115.01-115.09, and other applicable standards, regulations, orders or permits of the Agency relating to water pollution and disposal of sewage and industrial or other wastes.

ASW 1 APPLICABILITY, DEFINITIONS AND GENERAL CONDITIONS FOR HANDLING, STORAGE, TRANSPORTATION AND DISPOSAL OF ANIMAL WASTES. SEVERABILITY AND VARIANCES.

APPLICABILITY

These are regulations and standards the provisions of which govern the storage, transportation and disposal of animal wastes and the registration and issuing of permits for the construction and operation of animal waste disposal systems for the protection of the environment in keeping with Minnesota Statutes, Chapters 115 and 116 and Laws 1969, Chapters 847, 931 and 1046.

DEFINITIONS

For the purpose of these regulations:

(1) "Agency" Shall mean the Minnesota Pollution Control Agency, its agents or representatives.

(2) "Animal Manure" Shall mean poultry, livestock or other animal excreta or mixture with feed, bedding or other materials.

(3) "Animal Wastes" Shall mean animal manure which is stored, transported or disposed of as an unwanted waste material and which

poses a potential pollution hazard to the land, air or waters of the State. This shall not include animal manure used as fertilizer.

(4) "Feedlot Operator" Shall mean an individual, a corporation, a group of individuals, a partnership, joint venture, owner or any other business entity having charge or control of one or more livestock feedlots, poultry lots or other animal lots.

(5) "Fertilizer" Shall mean (a) animal manure which is put on or in the soil to improve the quality or quantity of plant growth, or (b) animal manure which is used as a compost, soil conditioners, or specialized plant beds.

(6) "Floodway" Is as defined in Minnesota Statutes, Section 104.05, Subdivision 4.

(7) "Land Pollution" Shall mean the presence in or on the land of any solid waste in such quantities of such nature and duration, and under such conditions as would affect injuriously any waters of the State, create air contaminates or cause air pollution.

(8) "Livestock" Shall mean beef and dairy cattle, horses, swine and sheep.

(9) "Livestock Feedlot" Shall mean the confined feeding, breeding, raising or holding of livestock in enclosures specifically designed as confinement areas in which animal manure may accumulate. This shall not include areas normally used for pasture or crops.

(10) "Odor" As stated in Minnesota Administrative Rules and Regulations APC 9 (c). The odor of growing vegetation, domestic fertilizers, insecticides and other natural odors shall not be considered objectionable.

(11) "Other Animal Lot" Shall mean the confined feeding, breeding, boarding or holding of any animal; except livestock; raised for its pelt, consumption as food, pleasure or sport; including; but not limited to, rabbits, mink, dogs, ponies, buffalo and deer.

(12) "Pasture" Shall mean areas where grass or other growing plants are used as foods for grazing. A pasture shall be deemed a livestock feedlot or poultry lot when the concentration of livestock or poultry is such that a vegetation cover is not maintained except in the immediate vicinity of temporary supplemental feeding or watering devices.

(13) "Poultry" Shall mean all domestically raised fowl, including, but not

limited to, chickens, turkeys, ducks, geese and game birds.

(14) "Poultry Lot" Shall mean (a) The place of confined feeding, hatching, raising, or holding of poultry in enclosures, yards or pens where animal manure may be accumulated; or (b) Range areas, not normally used for pasture or crops, in which animal manure may accumulate and be carried directly or indirectly to waters of the State or constitute a potential pollution hazard.

(15) "Shoreland" Is as defined in Minnesota Statutes, Section 105.485, Subdivision 2.

(16) "Sinkhole" Shall mean a hole worn through bedrock into which surface water drains to an underground channel.

(17) "Solid Waste" Solid waste is garbage, refuse and other discarded solid materials, except animal waste used as fertilizer, including solid waste materials resulting from industrial, commercial and agricultural operations, and from community activities. Solid waste does not include earthern fill, boulders, rock and other materials normally handled in construction operations, solid or dissolved materials in domestic sewage or other significant pollutants in water resources, such as silt, dissolved or suspended solids in industrial waste water effluents, dissolved materials in irrigation return flows, or other common water pollutants.

(18) "Storage Area" Shall mean an area associated with a livestock feedlot, poultry lot or other animal lot in which animal manure is placed for storage until it can be utilized as fertilizer or removed to a permanent disposal site. This shall not include animal manure packs or mounding within the feedlot area.

GENERAL CONDITIONS

All animal manure shall be stored, transported and disposed of in a manner consistent with the requirements of these regulations. The Agency is responsible for enforcement of these regulations in cooperation with local governing bodies which may adopt these regulations for use in local laws, ordinances or regulations.

SEVERABILITY

If any provision of any regulation or the application thereof to any person or

circumstances is held to be invalid, such invalidity shall not affect other provisions or application of any other part of such regulations or any other regulations which can be given effect without the invalid provision of application, and to this end the provisions of all regulations and the various applications thereof are declared to be severable.

VARIANCES

Where upon written application of the responsible person or persons the Agency finds that by reason of exceptional circumstances strict conformity with any provisions of the regulation contained herein would cause undue hardship, would be unreasonable, impractical or not feasible under the circumstances, the Agency may permit a variance from these regulations upon such conditions and within such time limitations as it may prescribe for prevention, control or abatement of land, air or water pollution in harmony with the intent of the State and any applicable Federal laws.

ASW 2 STORAGE, TRANSPORTATION AND DISPOSAL OF ANIMAL WASTES

(1) The owner and operator of any livestock feedlot, poultry lot or other animal lot shall be responsible for the storage, transportation and disposal of all animal manure generated on the property in a manner consistent with the provisions herein.

(2) All animal manure shall be stored in such a manner as to prevent the creation of a potential pollution hazard to the land, air or waters of the State.

(a) All storage areas shall be designed so as to restrict seepage, percolation or other movement of animal manure to ground waters.

(b) All storage areas shall be surrounded by a dike, wall or curb of such dimensions or construction that the storage volume will contain all the animal manure generated and divert around and prevent the entrance and admixture of snow melt and surface runoff from outside areas.

(c) All storage areas shall be sloped so that draining liquids can be collected and discharged from the area at one or more controlled

discharged points.

(d) If animal manure is stored as a slurry, storage tanks shall be designed to restrict objectionable odors. This shall not apply where animals or poultry are kept on slotted floors over a pit or where outdoor holding ponds or lagoons are utilized.

(e) All storage areas shall be located so as not to pose a potential pollution hazard to local wells or sources of potable water and shall be located at least 100 feet from such wells or water sources.

(f) All stored fertilizer shall be utilized and all stored animal wastes disposed of in a manner consistent with the provisions herein as soon as weather conditions and other factors permit. In no event shall fertilizer or animal wastes be stored for more than one year from the time of their generation unless animal manure packs or mounding is used as an operational technique.

(3) All fertilizer and animal wastes shall be transported in such a manner as to prevent the creation of a potential pollution hazard to the land, air or waters of the State.

(a) All vehicles used to transport animal wastes on county, State and interstate highways or through municipalities shall be covered and durable. This shall not apply to animal manure hauled to fields for use as fertilizer. Animal wastes in slurry form shall be transported in leak-proof vehicles or containers.

(b) All fertilizer and animal wastes shall be transported in compliance with the regulations of Federal, State and local governments and their regulatory agencies.

(4) All animal wastes shall be disposed of in such a manner as to prevent the creation of a potential pollution hazard to the land, air or waters of the State.

(a) Open burning of animal waste is prohibited except as shall be allowed by the regulations of the Agency.

(b) All treatment works for the control of animal wastes shall be constructed, designed and operated in accordance with statutes, regulations or criteria as administered by the Agency's Division of Water Quality.

(c) Disposal of effluents from systems for disposal of animal wastes

shall be conducted in conformance with applicable criteria, rules, regulations, or standards of the Agency relating to water pollution or disposal of sewage, industrial or other wastes.

(d) Land disposal of animal wastes shall be conducted in conformance with Minnesota Administrative Rules and Regulations SW 1-11.

(e) Animal wastes or fertilizer containing dead animals or animal entrails shall be disposed of in conformance with Minnesota Administrative Rules and Regulations SW 1-11, or regulations of the Minnesota Livestock Sanitary Board whichever may be applicable.

ASW 3 REGISTRATION, PERMIT ISSUANCE, DENIAL AND REVOCATION

It shall be unlawful for any person to establish, maintain or operate a livestock feedlot, poultry lot or other animal lot except as provided in these regulations.

(1) The Agency may, at its discretion, require registration of existing livestock feedlots, poultry lots and other animal lots. Conditions requiring registration and registration procedures for the abatement of pollution of land, air and waters of the State shall be determined by the Agency after public hearings have been held.

(2) A permit shall be required for all new livestock feedlots, poultry lots and other animal lots beginning after the effective date of these regulations.

(3) If the Agency determines that a livestock feedlot, poultry lot or other animal lot is, in fact, polluting or constitutes a potential pollution hazard to the land, air or waters of the State the feedlot operator shall submit an application for permit and upon plan approval obtain a permit from the Agency for the pollution control devices to be installed.

(4) Permits shall be issued at no charge to the feedlot operator. Each permit application shall include the following:

(a) A map or aerial photograph of the area showing all homes, buildings, lakes, ponds, watercourses, wetland, dry runs, rock

out-croppings, roads and applicable details and shall indicate the general topography with contours and drainage patterns. Wells should be indicated, a north arrow drawn and location insert map included.

(b) A description of geological conditions, soil types and ground water elevations; including high water table; to a depth of ten feet below the lowest elevation of the site.

(c) A plan indicating operational procedures, the location and specifications of proposed animal waste treatment works, land use for the disposal of animal wastes, and the quantity and type of effluent to be discharged from the site.

(6) Plans and specifications shall be approved and a permit issued when the director of the Agency believes they are in accordance with the requirements as set forth in these regulations and other applicable statutes, regulations, rules or criteria of the Agency relating to disposal of sewage, industrial, or other wastes. Although a permit shall be granted the same shall become effective only if the location of the site or facility shall conform to all applicable federal, State and local laws, ordinances and regulations.

(7) Permits may be denied, conditioned, modified or revoked for violation of these regulations. When a permit is denied or revoked, the applicant or holder shall be notified in writing of the reasons therefor. A denial or revocation shall not become effective for at least 90 days after written notification to the applicant or holder. A denial or revocation shall be without prejudice to the applicant's or holders right to an appearance before the Agency within 90 days, or for filing a further application after revisions are made to meet objections specified as reasons for denial or revocation. The applicant or holder shall have the right to an appeal pursuant to Minnesota Statutes, Chapter 15.

ASW 4 LOCATION REQUIREMENTS FOR LIVESTOCK FEEDLOTS, POULTRY LOTS AND OTHER ANIMAL LOTS

(1) All livestock feedlots, poultry lots and other animal lots shall be located so as not to constitute a potential pollution hazard to the land, air or waters of the State, except where corrective and protective measures approved by the Agency are taken.

(2) New livestock feedlots, poultry lots and other animal lots are prohibited within the following areas:

(a) Within shoreland

(b) Within a floodway

(c) Within 1,000 feet of the boundary of a public park

(d) In sinkholes or areas draining into sinkholes

(e) Within one-half mile of the nearest point to a concentration of ten or more private residences at the time of construction.

ASW 5 NONCONFORMING FEEDLOTS

Modification of existing livestock feedlots, poultry lots and other animal lots to conform to the requirements of these regulations shall be accomplished. When the degree of necessary improvement is of such extent that immediate compliance cannot be accomplished, special consideration shall be given by the Agency. In such event, the owner of the nonconforming livestock feedlot, poultry lot or other animal lot shall, not later than six months after notification by certified mail that a permit will be required, submit to the Agency a report setting forth a program, plans and time schedule for compliance with these regulations. In any event, compliance must be achieved within such time as deemed reasonable by the Agency.

NEBRASKA

SECTION I. – DECLARATION OF POLICY

Section 71-3004, Reissue Revised Statutes of Nebraska, 1943, as amended, provides in part as follows:

"71-3004. The Council shall have and may exercise the following powers and duties:

"(8) To adopt, modify, repeal, and promulgate, after due notice and hearing, and to enforce rules and regulations implementing or effectuating the powers and duties of the Council under the provisions of this act and as the Council may deem necessary to prevent, control, and abate existing or potential pollution;"

In an attempt to fulfill this statutory responsibility, complete information as to the occurrence and location of all sources of contamination and pollution is essential to the development of a sound water pollution control program. Feedlot registration is a necessary portion of an overall waste disposal inventory.

SECTION II. – DEFINITION OF TERMS

For the purpose of clarity and understanding in this Regulation, the following words, terms and phrases are hereby defined as follows:

1. "FEEDLOT" shall mean the confined feeding of food, fur or pleasure animals in buildings, lots, pens, pools, or ponds which normally are not used for raising crops or for grazing animals. For the purpose of this Regulation, the term "feedlot" shall include the following:
   a. The confined feeding at any one time of:
      (1) 300 or more feeder or fat cattle,
      (2) 100 or more beef cows,
      (3) 100 or more dairy cattle,
      (4) 500 or more swine,
      (5) 2,000 or more sheep,
      (6) 3,000 or more turkeys, or
      (7) 10,000 or more chickens, ducks or geese;
   b. Any other confined feeding operation that is located within 500 feet of any watercourse.
   c. Any other confinement of animals that has a water pollution potential; or
   d. Any feeding operation whose operator elects to register.
2. "WATERCOURSE" shall mean any depression or draw 2 feet below the surrounding lands and having a continuous outlet to a stream of water, or river, or brook. To be a watercourse, there must be a stream in fact as distinguished from mere surface drainage. Furthermore, to be a watercourse, the depression must have an outlet into a stream. A draw, although more than 2 feet deep where it enters land, does not

continue to be a watercourse where it flattens out and the water runs wherever gravity will take it.

3. "OPERATOR" shall mean an individual, a corporation, a group of individuals, joint venturers, a partnership, or any other business entity having charge or control of one or more feedlots.
4. "COUNCIL" shall mean the Nebraska Water Pollution Control Council.
5. "FOOD ANIMALS" shall mean cattle, fowl, sheep and swine.
6. "FUR ANIMALS" shall mean any animal raised for its pelt.
7. "PLEASURE ANIMALS" shall mean dogs and horses.

SECTION III. – REGISTRATION OF FEEDLOTS

The "operator" of any existing feedlot, as defined in this Regulation, shall register such feedlot with the Nebraska Water Pollution Control Council on or before July 1, 1968. The "operator" of any proposed feedlot, which will begin operation after July 1, 1968, shall register with the Council at least sixty days before beginning construction of any such feedlot operation.

The registration shall be on forms supplied by the Executive Secretary of the Council. A spearate form shall be used for each feedlot and shall contain a statement of: (a) the operator of such feedlot; (b) the location of such feedlot; (c) the size of such feedlot; (d) the number and kind of animals in such feedlot; (e) the name and location of any brook, canal, creek or river receiving drainage from such feedlot; and (f) such additional information conforming to the statements contained in Section I. of this Regulation.

SECTION IV. – FAILURE TO REGISTER

The failure to register any feedlot, as prescribed within the meaning of this Regulation, shall be considered in direct violation of the Rules and Regulations of the Nebraska Water Pollution Control Council and action for such violation shall processed pursuant to Sections 71-3008 and 71-3009, Reissue Revised Statutes of Nebraska, 1943, as amended.

Other Missouri Basin States are in the process of considering specific regulations, but at the present time rely on existing water pollution control statutes and regulations for the control of feedlot caused pollution.